GOETHE UNIVERSITÄT FRANKFURT AM MAIN

Fachbereich Physik
Institut für Theoretische Physik

CONDENSED MATTER THEORY SEMINAR

Subject: **The diverse footprints of quantum spin liquids in 3D frustrated magnets: Gearwheels, boomerangs, and much more…**

Speaker: **Dr. Yasir Iqbal (Julius-Maximilians-Universität Würzburg)**

Date & time: **Tuesday, May 16th, 2017 at 4 p.m.**

Venue: **Seminar room 2.114**

Abstract: Three-dimensional frustrated magnets have recently come into limelight as promising candidates to host the much sought after quantum spin liquid phase. Recent experiments on pyrochlore, hyperkagome, and diamond lattice compounds have revealed the presence of tremendously interesting and intriguing low-energy physics. However, progress on the theoretical front is lacking due to a complete vacuum of numerical many-body methods which can address three-dimensional spin systems of large enough size enabling reliable conclusions in the thermodynamic limit. Using the recently developed pseudo-fermion functional renormalization group (PFFRG) method which efficiently handles 3D spin systems, we address the low-energy physics of different spin liquid candidate materials in 3D which have been the subject of recent experimental investigation. The spin susceptibility profiles obtained within PFFRG are shown to be in excellent agreement with available neutron scattering data, which displays fascinating features, such as the presence of cogwheels, boomerangs, and bow-ties.